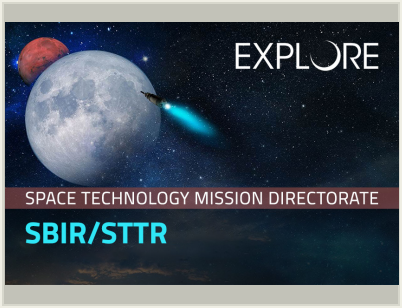
Programmable High-Rate Multi-Mission Receiver for Space Communications, Phase II

Completed Technology Project (2007 - 2010)

Project Introduction

Current and upcoming NASA space links require both highly reliable low-rate communications links supporting critical TT&C, ranging and voice services and highly efficient High-data rate links supporting Mission or Payload Data. Investing in re-usable elements, such as Programmable Communications Radios, for ground and flight data handling that are capable of receiving both kinds of links would address current Communication and Navigation needs without foregoing future capabilities. Additionally, the development, test, and optimization of new algorithms and modulation schemes require a high-speed platform able to be reconfigured as needed. Such a product would feature an open and modular architecture, allowing users to independently load and route custom code blocks. A modular and flexible High Rate Receiver Backbone (HRRB) would allow customization of some processing firmware and should accommodate advances in deployed link formats more easily than units "factory loaded" for particular signal types. SRI's Phase 1 SBIR researched, developed an architecture and test bed, and coded and tested an initial set of waveforms as a baseline for a Programmable High-rate Multi-mission Receiver. The results of this effort showed the technical and commercial viability of such a unit. The proposed Phase 2 effort will extend this innovation by developing and implementing an IF front end, refining and extending the performance of the ADC/DAC sections and hardware architecture, extending the architecture to support programmable and configurable decoding processing capacity, testing performance with both extended development support modulators/coders as well as other available high-rate modulators, and delivering a realized HRRB for further NASA use. Additional market segmentation, analysis, and prospect identification would be conducted in preparation for either a Phase 3 or independent SRI development of a market-ready Programmable High-rate Multi-mission Receiver (PHMR).



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Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Center / Facility:

Goddard Space Flight Center (GSFC)

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

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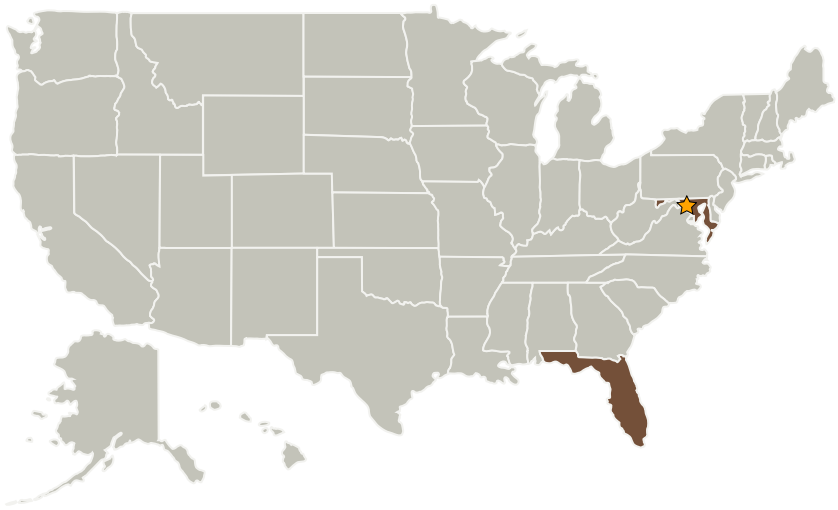
Primary U.S. Work Locations and Key Partners



Organizations Performing Work	Role	Type	Location
★Goddard Space Flight Center(GSFC)	Lead Organization	NASA Center	Greenbelt, Maryland
Summation Research, Inc.	Supporting Organization	Industry	Melbourne, Florida

Primary U.S. Work Locations	
Florida	Maryland

Project Transitions

December 2007: Project Start

November 2010: Closed out

Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Technology Areas

Primary:

- TX05 Communications, Navigation, and Orbital Debris Tracking and Characterization Systems
  - TX05.1 Optical Communications
    - TX05.1.7 Innovative Signal Modulations